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SOVIET CIVIL DEFENSE AND AIR-RAID SHELTER CONSTRUCTION

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CENTRAL INTELLIGENCE AGENCY

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SOVIET CIVIL DEFENSE AND AIR-RAID SHELTER CONSTRUCTION

Summary and Conclusions

1. The Soviet civil defense program is not new; rather, it represents a position achieved by the expenditure of considerable sums in construction and training since 1949. There appears to have been an increase in the scope and cost of the program since 1954, but there is no evidence of a sudden acceleration in the intensity of the program or that it is scheduled for completion coincident with a future target date set for the initiation of hostilities. The construction and training program has, however, continued to provide varying degrees of protection for a growing portion of the population. Since 1954 the civil defense training program has included some instruction for protection against nuclear weapons.

2. It is impossible to determine the precise state of civil defense readiness in the USSR. Security restrictions obscure such vital aspects of the program as the quantities of equipment provided, the extent and character of operational training, and the number and strength of heavier Soviet shelters. It is difficult for observers to detect civil defense activities, since indoctrination and training have generally been accomplished through small groups in such places as factories and club rooms without being highly publicized and since some of the more obvious preparations, such as the posting of shelter signs, will not, in accordance with stated doctrine, be carried out until the declaration of an emergency. Even trained observers have difficulty detecting the existence of shelters, since many of the identifying features of these shelters cannot be readily spotted and since hermetic sealing and ventilating units are often installed after the building has been completed. As an example of the

problems of observation, little detailed information concerning the civil defense program in Hungary was available before the uprising in 1956. Since then, however, interrogation of large numbers of Hungarian refugees has revealed extensive civil defense preparations.

3. The organization of civil defense in the USSR encompasses the use of a corps of staff officers of the local air defense organization (MPVO) assigned at all levels of government for planning and direction; the maximum use of existing facilities, organizations, and services for carrying out the program; and the use of large public organizations for general training of the population in first aid and civil defense. The MPVO structure also includes an MPVO-MVD school in Leningrad, a Central Scientific Research Laboratory, and an experimental medical plant.

4. Although there has been some civil defense training for protection against nuclear weapons, information on the probable extent of blast damage and the area coverage and possible persistency of radioactivity resulting from explosion of megaton weapons has not been made generally available. Furthermore, there has been no training for mass evacuation, and all known civil defense instructions advise the population to use the nearest shelter under conditions of air attack.

5. Participation in the civil defense training program is probably compulsory for most able-bodied citizens. Deputy Minister Tolstikov of the MVD stated at a recent paramilitary conference that 85.5 percent of the population had taken a civil defense anti-atomic training course. Although this figure may be somewhat inflated, particularly as it relates to rural areas and refers only to an elementary course, two more advanced courses are programed for the entire population and are scheduled for completion in 1958 and in 1960.

6. A program to include reinforced basement shelters in the construction of new public buildings, factories, schools, and apartment dwellings was initiated as early as 1949. In this part of the program, priority has been given to the protection of Soviet Party and government personnel and of personnel of important economic enterprises. About 200 reports, including many from returning prisoners of war who worked on basement shelter construction, indicate that air-raid shelters were included in most building construction observed. These shelters, however, were in varying states of readiness, some being fully equipped and ventilated, others having little more than steel doors and roughed-in ventilation openings. Some basements, such as those seen in early stages of construction by Western observers, have only the basic compartment walls in place. Such basement refuges are of modest strength but would nevertheless reduce immediate casualties in peripheral damage areas.*

7. Soviet authorities undoubtedly intend to use the Moscow subway as well as subways in other cities as air-raid shelters. It now appears well established that since about 1955 they have been installing doors in the Moscow subway for air defense purposes. There is also evidence that some shelters have been provided in connection with theaters and railway stations.

8. On the basis of a small number of reports from the USSR -- some well confirmed -- it is believed that about 1953 the USSR began the construction of heavy air-raid shelters at important economic enterprises. A few reports suggest that heavy shelters were also being provided for certain key Party and government facilities. A substantial number of heavy shelters have been reported from Hungary, but the extent of the program in the USSR has been successfully hidden.

9. The precise extent of the Soviet shelter program is unknown. There is evidence that most state-owned housing of masonry construction built since 1951 has included some provision for a shelter area. In

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* See Figure 1, following p. 5.

addition, as indicated above, there are shelters in factories and in public buildings and installations. It is roughly estimated that existing shelters could accommodate a minimum of 10 million to 15 million of the total urban population (74 million) and could provide at least partial protection. It is recognized, however, that the availability of shelter protection would depend on such factors as the time of day and the day of the week because these factors affect population location. In the light of recent Soviet civil defense instructions which stress the value of basement shelter even under atomic attack, it is expected that the Russians will continue to build and improve these shelters. At the same time, it can be expected that the construction of other shelters, including heavy bunkers, will be continued for workers and certain vital facilities in essential industrial, transport, and communications activities and for Party and government personnel.

10. Available intelligence indicates that within a number of European Satellites certain civil defense preparations are well advanced. In Hungary, for example, the extensive intelligence information gathered from interrogations following the 1956 uprising revealed advanced civil defense preparations including compulsory civil defense training enforced by fines, the development of national guard type civil defense battalions, and the construction of heavy air-raid bunkers for the protection of personnel in major economic enterprises. There is also some evidence that these programs within the European Satellites are coordinated and guided by Soviet authorities. On the basis of known Satellite programs and their ties to the USSR, it is likely that certain activities discovered in the Satellites are also being carried on within the USSR on a more extensive basis than indicated by currently available intelligence.

11. The adequacy of protection afforded by the shelter program outlined in the above paragraphs has not been analyzed in this report, because this would require more detailed consideration of the structural characteristics of the shelters in association with such weapons variables

as yield, location and height of bursts, and meteorological conditions. Also, no attempt is made in this report to estimate the number of shelters that might survive nuclear attack, but any surviving shelters that might remain air-tight and equipped with adequate filtered ventilation, water, food, and medical supplies would substantially reduce casualties which might otherwise result from fall-out of radioactive particles.*

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* See Figures 2, 3, and 4, following p. 5.

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Figure 1

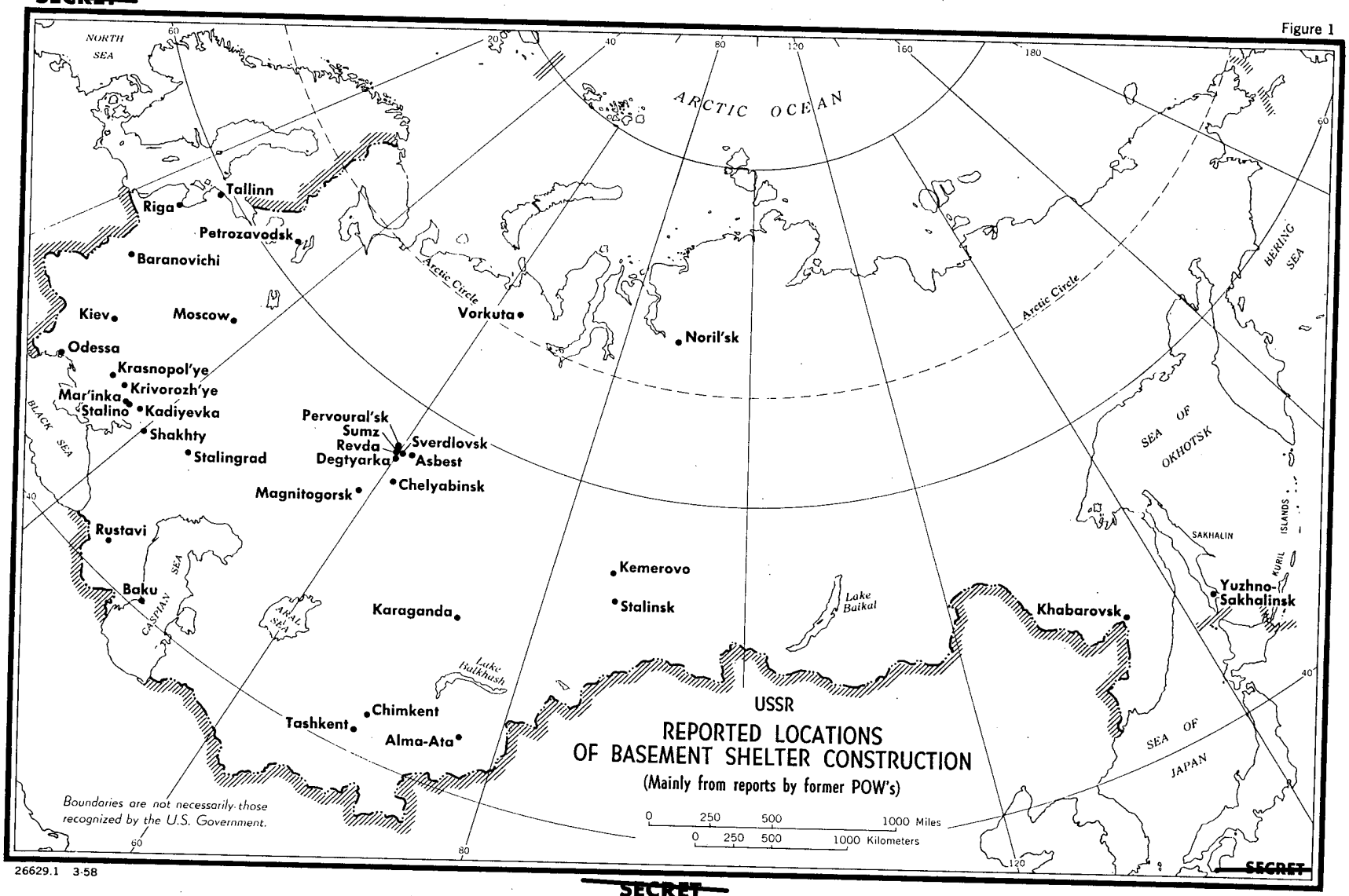

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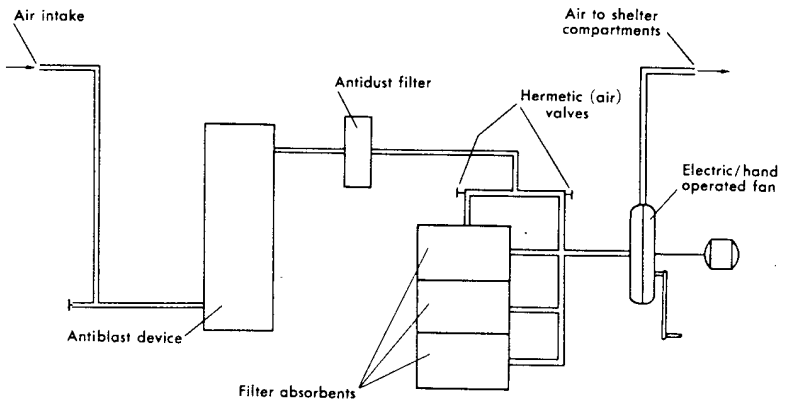
Figure 2

SKETCH OF A FILTER VENTILATING SYSTEM FOR A SOVIET AIR-RAID SHELTER (1956 USSR Manual)



FILTER VENTILATING EQUIPMENT (From Soviet Photo—1955)

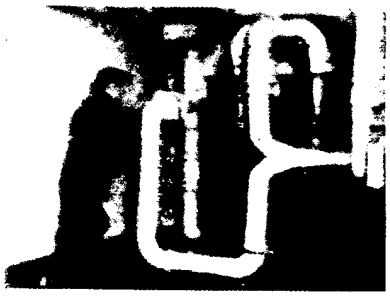
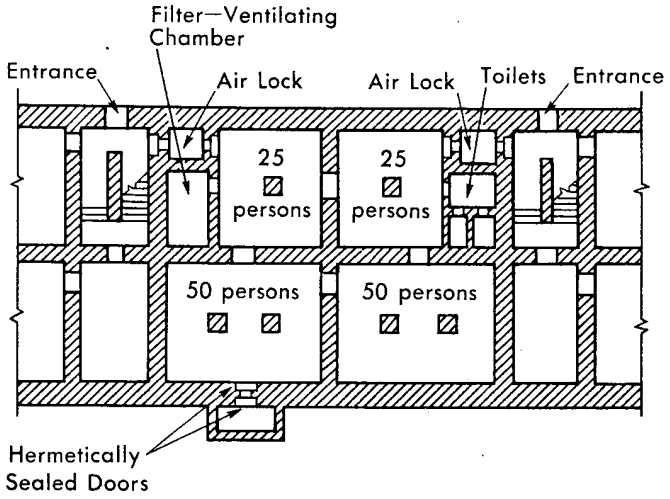


Figure 3

SKETCH OF APARTMENT AIR-RAID SHELTERS IN THE USSR

FLOOR PLAN



CONSTRUCTION OF BOMB SHELTERS IN BASEMENT OF APARTMENT BUILDING, KIEV 1956

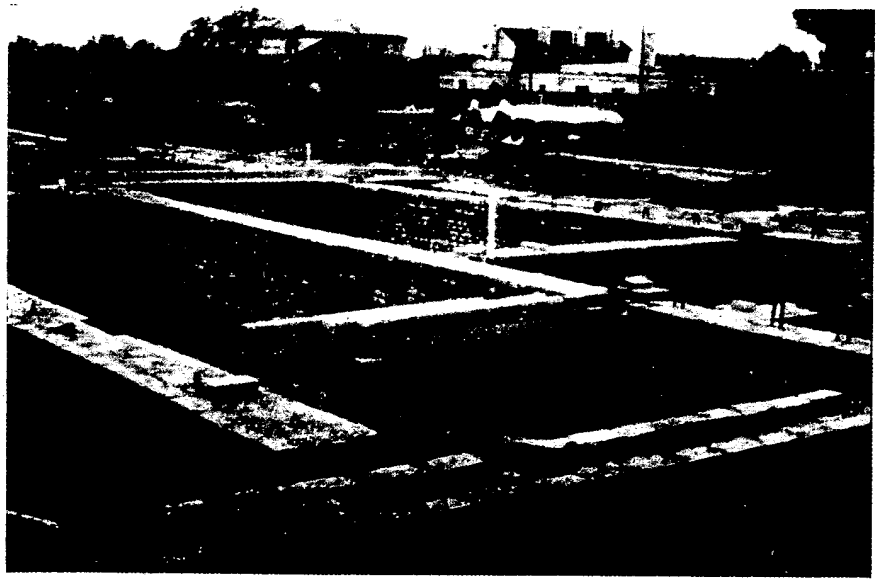
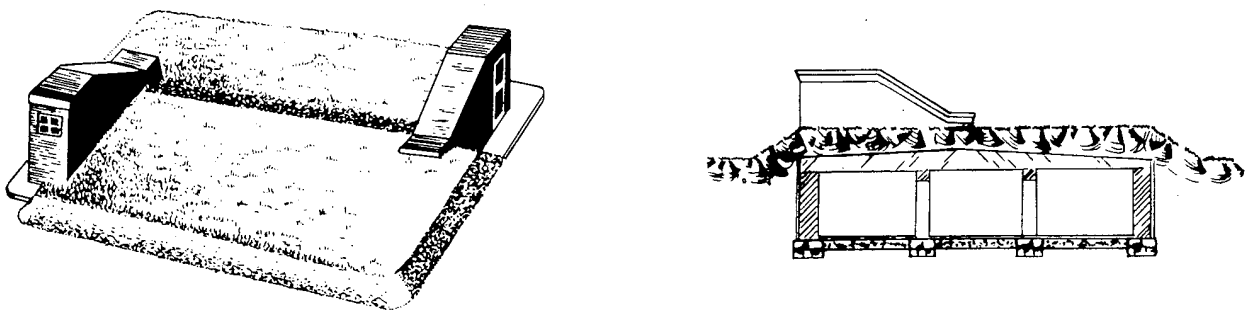
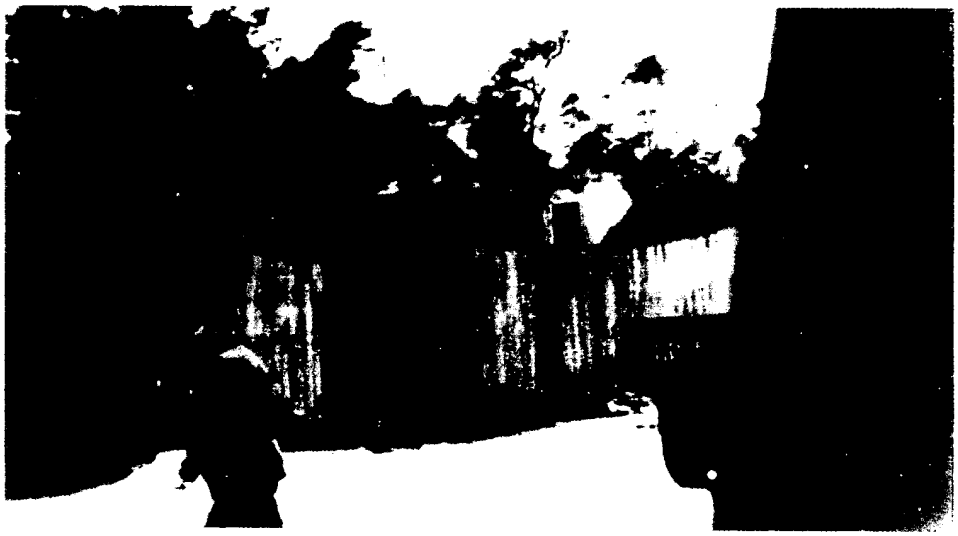


Figure 4

SKETCH OF A SOVIET DETACHED AIR-RAID SHELTER
(From 1956 USSR Manual)



DETACHED UNDERGROUND SHELTER
(Latvia 1956)



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DISCUSSION

A. Organization.

12. The organization of Soviet local anti-air defense (MPVO)* involves the use of a corps of MPVO staff officers for planning and direction; the maximum use of existing governmental and economic facilities, organizations, and services for implementation; and the use of mass social organizations for the general training of the population in first aid and civil defense.

13. MPVO staff officers of the MVD function at all levels of government. An integral part of over-all Soviet Air Defense (PVO), civil defense has been the responsibility of the Main Administration of Local Air Defense (GUMPVO), an arm of the Ministry of Internal Affairs (MVD). (Recently there have been some changes in terminology in referring to civil defense offices.) Subordinate to GUMPVO are directorates at the republic level and MPVO staffs (Shtab MPVO) for rayons and cities. In 1956, the MPVO staff of one medium-size Soviet city was described to include an MVD colonel in charge, MVD captains in charge of each city rayon (four in number), and another captain to supervise training. It is believed that officers with this type of assignment receive special civil defense training, probably at an MPVO-MVD school known to exist in Leningrad. GUMPVO also operates a Central Scientific Research Laboratory and a medical experimental plant.

14. At the city level the Soviet MPVO system relies heavily on the organizations in being to furnish the leadership and nuclei of operative civil defense services. Such organizations include the local police and fire departments, medical installations, and communal repair services.

* Hereinafter referred to generically as civil defense.

These are organized in civil defense units which include Fire Defense, Emergency Engineering, Medical, Maintenance of Order and Security, Warning and Communications, Shelter and Cover, Blackout, Veterinary, and Decontamination Services. Auxiliary personnel are recruited to bring units to desired strength. If the city is divided into rayons, additional civil defense services are organized at this level.

15. It should be stated that the nominal head of each governmental or economic unit is also the responsible leader for civil defense. For example, the chairman of the city executive committee or the plant manager is also a civil defense commander. His chief of staff MPVO, however, is obviously the official supervising material preparations and training.

16. Principal enterprises (called national-economic installations) are evidently directly subordinate to city MPVO headquarters. They are organized for civil defense to include nearby workers' settlements. In residential buildings, and in schools and institutions, "self-defense" groups are formed. The dwelling manager or head of schools or institutions is automatically the chief of MPVO and is responsible for organizing appropriate teams.

17. Both the PVO authorities and the MPVO have roles in the approval of new construction. It is known that the MPVO takes part in the peacetime function of town planning. It has been reported that PVO issues permits for new industrial sites with MPVO having the power to review plans. These functions are probably closely coordinated. Reportedly each architectural planning trust employs an air defense specialist, and MVD officers have been observed inspecting basement air-raid shelters in new buildings. These measures enable air defense and civil defense authorities to influence the dispersion of plants and the provision of air-raid facilities in new construction.

B. Characteristics of Soviet Civil Defense.

18. The pattern of Soviet local air defense differs in concept from that of civil defense in the United States. To Western observers, one outstanding characteristic of Soviet civil defense has been a lack of publicity and easily visible evidences. A recently returned American correspondent said, "There is no overt civil defense program in Moscow such as exists in New York." Other travelers comment on the absence of shelter signs and city-wide drills. These are valid observations. Civil defense training as described in open Soviet publications and in intelligence reports has so far taken place largely in factories and dwelling units or within paramilitary groups in clubhouses or isolated areas. (A few city blackout exercises, however, have recently been reported from several areas.) The absence of shelter signs is readily explained by Soviet civil defense instructions which require the posting of signs upon receiving notice of a "threatening situation." Publicity for civil defense in the USSR is accomplished largely through paramilitary and Red Cross publications supplemented by civil defense instruction courses.

19. Second, it seems obvious that Soviet civil defense is under security restrictions. For example, although sketches of Soviet air-raid shelters are frequently included in civil defense publications, photographs are never found. Planning assumptions for civil defense have not been seen, nor have detailed operational instructions for specific areas or cities. Air-raid shelter plans, other than general schematics, have not appeared in the USSR. (From Hungary, however, we have recently received a book of instructions on the construction of air-raid shelters which was classified in that country.) Mentions of civil defense staffs were not found in the Soviet press between 1951 and 1956, and the national MPVO office and its head have not been openly identified since World War II. [redacted] tells of having seen Soviet civil defense instructions classified "top secret."

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20. A third aspect, which may be linked with security, is the reticence on the part of Soviet authorities to reveal the possible scope of the effects of nuclear weapons on the general public. The USSR since 1954 has guardedly released to the Soviet public some information regarding the effects of nuclear weapons. This has been accomplished through military and paramilitary publications and civil defense instruction rather than through articles in the daily press. Although the average Soviet citizen has not been fully informed, he has been assured that the USSR has effective active air defenses (PVO) and that the use of shelter will do much to reduce casualties in the event of atomic attack. He knows that fires can be started by nuclear weapons and that there is also danger from radioactive contamination. The effect of the latter, he is instructed, can be reduced by the use of properly ventilated shelters or by the use of gas masks and protective clothing. The Soviet citizen does not know the size of the blast damage areas that can be caused by the larger yield nuclear weapons. Neither does he know the area nor the possible persistency of radioactivity created by the hydrogen bomb. He has never been introduced to an evacuation plan and may thus be spared reeducation to a shelter concept.

21. It seems evident, at present, that Communist authorities emphasize control and do not intend to grant any mobility to the population in the event of air attack. All known civil defense instructions advise the population under air attack to seek the nearest shelter, digging in if formal shelter is not available. The average citizen must remain in place, regardless of what happens, and cope with the local situation as best he can.

22. Fourth, there has evidently been a priority system in the preparation of air-raid shelter and defense organizations in the USSR. Except for adaptable subways, few heavy shelters have been reported which are available to the general population, who must rely principally on relatively light refuge areas in apartment basements or prepare field shelters

in the event that formal shelter is not available. Recent reporting indicates that substantial shelters have been prepared for government buildings and large economic enterprises. Civil defense drills which have been observed have occurred principally in industrial units.

23. Finally, civil defense is centrally controlled by an office of the Ministry of Internal Affairs, and civil defense service and training can be required of any USSR citizen. A World War II law, whose repeal has not been reported, made able-bodied citizens aged 16 to 60 liable to serve in civil defense assignments. At a recent paramilitary conference, Marshal Konev called for the inclusion of the "whole Soviet population, without exception," in preparation of the country for air defense, and Deputy Minister Tolstikov of the MVD announced that 85.5 percent of the population had already been given a civil defense anti-atomic training course. Although the figure may be somewhat inflated, particularly as it relates to rural areas and refers only to an elementary course, two more advanced courses are programed for the entire population and are scheduled for completion in 1958 and in 1960.

C. Civil Defense Construction.

1. World War II.

24. The facilities used or adapted for air-raid shelters during World War II included railroad tunnels, mines, reinforced basements in public buildings, grain elevators, bunkers, aqueducts, sewer pipes, and wine cellars. The inhabitants of Moscow sought refuge in the deeper Metro stations, and at nights the tunnels themselves were used as shelters. An American correspondent noted that 750,000 people were sleeping in the subway at the time of the heaviest German raids and that subway stations were equipped with steel doors and air filters.

25. Shelters were constructed for some government buildings, and there are persistent reports of a large shelter under the Kremlin which could be reached from Stalin's office by a private elevator. A source, [redacted] reported that in 1943 a large underground shelter for use of officials had been built 7 kilometers north of Kuybyshev, the city to which part of the Soviet government was evacuated during the war.

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26. [redacted]

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27. After 1937 it was reported that some factories received capital advances for the construction of air-raid shelters, and some were prepared by adapting cellar compartments or building small underground bunkers.

28. In 1938, Khrushchev was involved in ordering basement shelters in selected Moscow apartment houses, [redacted]

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[redacted] These shelters were located along the route generally used by high officials in traveling between their work and suburban homes. The same source noted that new school buildings in Moscow and older government buildings were being equipped with basement shelters in the late 1930's.

29. Other reports relate that some Soviet citizens were able to take refuge in apartment house basements during World War II but that most dwellings had no cellars and in this case, the population dug trench-type air-raid shelters for themselves, some with earthen ceilings. Articles in the Soviet paramilitary press recently noted that the tunnels of Stalingrad and the catacombs of Sevastopol', Odessa, and Kerch' were useful as air-raid shelters during the war.

2. Shelter Planning.

30. In view of the security measures connected with Soviet civil defense, it is unlikely that information on the directives establishing the program for shelter construction in the USSR will become available.

31. There are, however, indications of a general plan to provide air-raid shelters in the USSR. A 1952 Soviet civil defense manual includes a reference to "underground installations constructed in accordance with a special plan for protecting the population in case of enemy attack." The manual, in the same paragraph, speaks of the conversion of existing cellars and basements as well as the construction of field-type shelters. A returning prisoner of war heard in Sverdlovsk in 1953 that basements with air locks and iron doors were being provided in accordance with building regulations "within the scope" of new Soviet air-raid precaution legislation. A [redacted] reported that in Khabarovsk all postwar building projects were "regulated from the standpoint of air defense" and that air-raid

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shelters were constructed in basements. Additional reports from other areas note orders or rulings requiring basement shelters in new buildings.

3. Basement Shelter.

32. A leading Soviet civil defense writer, P. Kirillov, stated in 1947 that the "extensive construction of shelters of the first category," presumably heavy bunkers, was not feasible and urged that available basements be adapted and simple cover constructed to be used along with shelters of the first category. Soviet civil defense literature since 1950 seems to have stressed quantitatively the use of basement-type shelters and simple cover (field-type shelters). A 1956 DOSAAF publication, Chto nado znat' ob otravlyayushchikh i radioactionykh veshchestvakh (What One Should Know About Poisonous and Radioactive Substances), stated that "to protect large groups of people in large cities, special shelters are being built or the basements of well-constructed, multistory buildings of masonry are being utilized."

33. One of several articles published as early as 1951 and 1952 described basement shelters as follows:

> "Air-raid shelters are specially equipped quarters, intended for protecting people during air raids and during shelling by artillery. As a rule, shelters (usually set up in cellars) offer sufficient protection from bomb fragments, artillery shells, incendiary bombs, and from fragments of building materials.

> "Each shelter has two entrances, which also serve as exits. One of these is the main exit, the other, the emergency exit. Up to 150 persons may be accommodated in a cellar shelter (depending on its size). The shelter has the following rooms: air locks at the entrances, compartments to shelter the population, air-purification chambers, and toilets. The capacity of each compartment usually does not exceed 50 persons, with each compartment divided off by strong walls.
>
> "The shelter is equipped with electric wiring and a ventilating system for providing fresh air. If the outside air contains gases (in event of a chemical attack by an enemy), air is admitted into the shelter through a special filter, which purifies the air. ... A sufficient quantity of drinking water is kept stored in special containers."

Other descriptions generally note that the shelter "should have" ceilings capable of resisting the weight of the upper parts of the building in case of cave-in.

34. Many repatriated German prisoners who were interrogated between 1953 and 1956 had worked on new masonry construction in the USSR. They described cellar shelters in masonry apartments at such varying locations as Sverdlovsk, Asbest, Pervoural'sk, and Revda in the Urals; Stalingrad on the Volga; and Kiev, Krasnopol'ye, and Stalino

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in the Ukraine. Returning Japanese reported similar construction in Far Eastern cities. More recent information, including that obtained from Soviet defectors [redacted] has swelled the number of cities which are reported to have some basements constructed for shelter purposes to 33 and the number of reports of such construction to approximately 200.

35. In the cities of Alma Ata, Revda, Chimkent, Asbest, Stalino, Stalingrad, and Sverdlovsk, one or more of the returnees gathered the impression or were told that all newly constructed buildings were built to contain air-raid shelters. This is probably an exaggerated impression inasmuch as some buildings have been reported built without basements, and in other cases shelter was provided for in neighboring structures. Nevertheless, in several of these cities, observation accounts have been numerous enough to justify the assumption that shelters were generally provided.

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36. Most basement air-raid shelters are said to have walls with thicknesses varying from about 16 to 32 inches and with concrete ceilings 5 to 9 inches thick. Gas-proof steel doors -- double, with an air-lock between -- are common to the majority of reports, as are openings for ventilation. In most instances, filter ventilating devices were not installed at the time of observation, but [redacted] these were considered a classified item, and the intention may have been to install ventilation later using Soviet workers. [redacted] noted that crated ventilating devices were received and stored in Tashkent shelters in 1956.

Most Western observers, however, have supplied only negative information as to the general existence of basement shelters in the USSR.

37. [redacted] believed in general that the apartment basements they saw were not suitable for shelter purposes. They did note the characteristic heavy construction in new buildings and complex wall arrangements in basements. Several of the group believed that basement ceiling slabs, about 6 inches thick, were not strong enough for any substantial blast protection. They did not find the steel doors or report the ventilation openings common to many of the prisoner-of-war reports.

38. One member of the group, however, reports having inspected apartment basements without invitation in Stalingrad and finding air-raid shelters which he described as cut up into rooms approximately 100 to 150 feet square, with walls and ceilings between 12 and 24 inches thick and equipped with steel doors offset in such a manner that a blast would blow out only one at a time. This person made the observation that, "the fact that we saw this type of construction only at Stalingrad does not mean it was used only in that city. At other places our hosts were more successful in keeping us on the organized tour and out of basements." Another member observed (without invitation) basement air-raid shelters and steel doors in Kiev apartments. These facilities had poured concrete ceilings. He stated that they appeared to be excellent bomb shelters.

39. The actual discrepancy between most Western observation on the one hand and reports of prisoners of war on the other hand may consist largely of differing definitions of an air-raid shelter. The "normal-type" basement reported by Western observers as being generally provided is characterized by normal depth; heavy walls, about 24 inches thick; and a concrete slab ceiling 6 to 9 inches thick. The thickness of average basement walls constructed in the USSR generally exceeds what is considered normal in Western design standards and specifications.

40. The prisoners of war, except in a few cases, have reported as an air-raid shelter "special" basements, at no greater than normal depth, with walls 24 to 40 inches thick and ceilings 6 to 9 inches thick. The prisoners of war identified the purpose of the facilities by having seen plans, by having been told by Soviet authorities that they were to be used as air-raid shelters, or by having noted identifying special shelter characteristics such as steel doors, escape tunnels, or filter-ventilating devices. In some cases, prisoners of war have described such special basements without identifying them as air-raid shelters by merely referring to them as "basement to be used as air-raid shelters." Prisoner-of-war sources have occasionally discounted the value of such special basements but have also reported that Soviet authorities were convinced that they furnished good protection.

41. If this similarity between Western reports of "normal basements" and repatriate reports of "basement shelters" in reality refers to similar structures, it explains references to basements and basement shelters which sometimes appear interchangeable in interrogation reports and Soviet defense literature. A recently received MPVO manual, in fact, includes a sketch of a basement shelter with no stronger first floor (or basement ceiling) indicated than are other floors of the building.

42. An improbable alternative to this reconciliation in terms of reporting is that basement shelters have been prepared only in some areas and that these are localities which happen to have been visited by prisoners of war. [redacted]

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43. A second alternative which might be examined is that construction of basement shelters took place extensively in the USSR during the principal time of prisoner-of-war observation -- 1949 to 1953 -- but that construction of special basements was then greatly reduced. Arguments for this theory include less frequent reporting after 1953, lack of current observation by Westerners, and a possible awareness on the part of the Soviet authorities that the power of modern weapons makes basement shelter appear inadequate. Opposed to this theory would be the continuing insistence in Soviet instruction issued through 1957 that basement shelters are the best means of mass protection against modern weapons, good evidence that several European Satellites have been following the Soviet lead in providing basement shelters during new construction, and occasional reports from the USSR to this date that such shelters are being built. If, indeed, suspension of basement shelter construction were the case, the more alarming possibility would arise that the Soviet authorities have changed their program in order to provide heavier and more effective shelters similar to the heavy bunkers and tunnel types reported by Hungarian refugees.

44. The most plausible explanation, at this time, is believed to be that the reported program initiated about 1949, probably by civil defense authorities, called for the inclusion of basements adaptable as air-raid shelters in most new masonry buildings. These have been, and in the main continue to be, provided. These basements are probably in varying stages of completion, some being fully equipped and ventilated, others having little more than hermetic steel doors and roughed-in ventilation openings, while some basements -- such as those seen in early stages of construction by Westerners -- have only the basic compartment walls in place.

45. It is apparent that, in any case, the majority of these housing shelters are modest in strength and that without reinforcement they might not answer even the basic requirement stated earlier that they should be

able to withstand building collapse. Nevertheless the use of basement shelters would reduce casualties in areas of light blast damage.

46. No definitive estimate can be made of the number of fully prepared basement shelters in the USSR. If, however, some provision has been made to provide adaptable basements or basement shelter in most new apartment building since 1950, then roughly 10 to 20 percent of the urban population now have this type of refuge. This figure could rise to as much as 30 percent by the end of 1960. In calculating the percentage of the suburban population which could be protected by basement shelters, it is not possible to prepare a breakdown indicating the number of people who could be accommodated by various types of shelter -- that is, basements adaptable as shelters, developed basement shelters with an average roof cover of about 6 to 8 inches, and the heavier basement shelters which are sometimes reported.

4. Public Shelters.

47. The Moscow subway has been extended since World War II, and most of the system is of considerable depth. [redacted] Civil defense exhibits and literature in the USSR indicate that the Soviet authorities plan to use the subway for shelter purposes. Adequate closures and ventilation safe from heavy blast are, of course, necessary. Some stations were equipped with steel doors during World War II, and more have probably been added since then. [redacted] have occasionally noted shielded construction going on in subway stations.

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48. One returning American official feels quite definitely that doors were being installed in the Moscow subway in 1955 and 1956. In 17 stations which he examined he found construction strongly suggestive of such installation. Work was not actually observed and apparently was

carried on during the night. In locations, usually at the top and bottom of escalators or occasionally in other locations where the pedestrian passages narrowed, he felt that a continuing effort was going on to provide closures which would afford protection to the lower station levels. The most prevalent type of construction strongly indicated that doors were being installed which would slide into the walls, and in one or two instances he was able to obtain a glimpse of a series of roller hangings installed at the top of the opening. When finished, the opening in the arch was covered by an ornamental grill, and what appeared to be a track in the floor was covered with loose boards, diamond steel plate, an asphalt-like substance or loosely laid tiles. Other sources have reported similar construction at additional stations. A Western visitor noting boarded-up construction at the bottom of a subway escalator in 1956 was told by a Soviet acquaintance that "they were building bomb-proof doors."

49. The new Lenin Hills extension of the Moscow subway, originally planned to run under the Moscow river, is now to be built over the river. Considerations leading to this change in plan may be the reduced cost of surface construction or some special engineering difficulty. The continued installation of doors in older subway stations, however, seems to indicate that Soviet authorities still intend to make it available for shelter purposes.

50. The Leningrad subway has also impressed Westerners with its potentiality for use as a deep-level, mass air-raid shelter. One American reported recently that the 10 Leningrad stations are quite large in area and that each could accommodate many times the number of people that could be placed in a Moscow or New York City subway station.

51. Other subways have been reported in the USSR. One in Kiev has evidently been under construction for a number of years.

It is probably still incomplete. Another subway is under construction in Tbilisi. A subway in Baku has recently been reported by two sources. One stated, "It was widely rumored that partially completed subway tunnels in Baku had been prepared as shelters. Between 1954 and 1955, subway construction had been discontinued for unspecified reasons." Four fenced entrances were reported to which access was forbidden.

52. Reports of other public shelters are few in number. A detached shelter of strength comparable to the basement shelters described by prisoners of war was illustrated in the Soviet 1956 civil defense manual, and a few of these have been reported built. They are covered with about 40 inches of earth. One photograph of a shelter of this type in Riga has been received.

53. Sizable railway station shelters have been reported from the European Satellites, and two reports have recently been received of a shelter under the Yerevan railway station in the USSR.

5. Party and Government Shelter.

54. It is believed that since World War II most new Party and government buildings were equipped with basement air-raid shelters at the time of construction. In Baku a new Party building with a strong reinforced concrete basement was completed in 1948. A Party building in Kiev completed in 1948 was reported to have a double basement. Two reports have been received describing a shelter-equipped clubhouse completed in 1953 at Degtyarka. One report estimated the basement shelter would accommodate 600 to 800 persons. Clubhouses built at Shakhty and Revda in 1953 and 1954 allegedly were constructed with basement shelters. Since 1946, basement shelters have been reportedly installed in government buildings and military headquarters at such widely separated places as Krasnopol'ye, Tallin, Baku, Kiev, Revda, Voroshilovgrad, and Khabarovsk. Recent reports tell of

government shelters in Riga and heavy basements under government buildings in Yerevan. [redacted] Few of these reports are confirmed, but it is highly probable that Party and government offices have been among the first to be provided with air-raid shelters. Similar reports of government shelters in the European Satellites add credence to Soviet reports.

55. Unconfirmed published accounts of construction of government shelters outside Moscow, combined with reports of dispersed government shelters near one Satellite capital, make it probable that some protected alternate control centers have been prepared in the USSR.

6. MVD Offices and Quarters.

56. As the body charged with supervising civil defense preparation in the USSR, and consistent with its mission of maintaining control, the MVD has received special consideration in being provided with air-raid shelters. The MVD headquarters in Moscow has several times been reported to have particularly deep and heavy shelter under the building. In Tallin, the capital of the Estonian SSR, work was reported in progress in 1953 to build basement shelters with "hermetic installations"; in buildings used by the armed forces, state security, and militia, however, basement shelters were reported to be completely ready. MVD barracks, officers' quarters, fire training schools, and the like have been reported from various cities to have basement shelters.

7. Schools.

57. The preparation of basement air-raid shelters in school buildings was initiated before World War II. Postwar reporting on the

construction of such shelters comes from Tashkent, Revda, Karaganda, Khabarovsk, Asbest, and Sverdlovsk. The shelters are apparently similar to other Soviet basement shelters, although some are reported to have heavier roofs than the usual 6 inches of concrete cover. Identifying features include gas-tight steel doors, ventilation shafts, and, in some instances, escape tunnels. Dates of construction vary from the end of World War II to 1955. Although reporting is limited to schools observed during construction by prisoners of war, some of these locations are partially confirmed by being described by more than one source.

8. Communications Protection.

58. The USSR has made some progress in reducing the vulnerability of its communications system by developing microwave relay networks and increasing radio capabilities. It has also built some protected radiobroadcasting facilities and is constructing underground long-line cables.

59. Information from the European Satellites indicates that some radiobroadcasting stations and long-line terminals there have been placed underground, and a Hungarian refugee reports having been told of underground radio stations in the USSR. An eyewitness description of an underground Soviet radio jamming station has been received from a competent Western observer. This massively constructed station near Moscow had 2 buildings with 3 stories below ground, the portions above ground being of heavy construction and having concrete walls about 2 feet thick. The first below-ground floor in the larger building contained transmitters; the second, cooling and air conditioning equipment; and the third, generators and maintenance shops. Sizes of the buildings were estimated to be 300 by 80 feet, and 200 by 60 feet, both painted with camouflage colors. Reports of underground broadcasting facilities and auxiliary telecommunications centers

in several Satellites make it probable that more of such installations have been constructed in the USSR.

9. Industrial Shelters.

60. Shelters in industrial plants are reported to have been constructed in more than a dozen Soviet cities. There is no reason to believe that the existence of these is exceptional. Considering the Soviet concern for developing and protecting an industrial economy, evidence supports a judgment that the Soviet authorities would provide shelters for workers in important industrial plants. The construction of shelters at enterprises has been ordered in several Satellite nations. Many heavy shelters for industry have been reported by refugee sources to have been built in Hungary. [redacted] has said that 40 percent casualties among the general population in Hungary were expected by civil defense planners, whereas only 10 percent casualties were anticipated among industrial workers.

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61. One Soviet plant, known to have constructed postwar air-raid shelters, is located in as remote an area as Magadan. In this plant a basement shelter was built about 1952. The second shelter, a detached underground structure, was built between 1953 and 1955. This is described as nearly 7 feet underground, with cinder block walls about 40 inches thick and with a reinforced concrete roof 2.6 feet thick. "Labyrinthine" entrances were at either end of the shelter. The size of the shelter is remarkable inasmuch as it could accommodate about 1,600 persons by Soviet standards. The plant was estimated to employ 1,500 to 1,700 workers.

62. Another confirmed underground bunker was built next to the administration building of a tank plant in Khabarovsk. A Western visitor has reported seeing air-raid shelters in a Moscow aviation plant in 1954. There is good evidence that heavy air-raid shelter construction is presently being carried on in Soviet industry.

63. The precise extent of the Soviet shelter program is unknown. There is evidence that most state-owned housing of masonry construction built since 1951 has included some provision for a shelter area. In addition, there are shelters in factories and in public buildings and installations. It is roughly estimated that existing shelters could accommodate a minimum of 10 million to 15 million of the total urban population (74 million) and could provide at least partial protection. It is recognized, however, that the availability of shelter protection would depend on such factors as the time of day and the day of the week because these factors affect population location. In the light of recent Soviet civil defense instructions which stress the value of basement shelter even under atomic attack, it is expected that the Russians will continue to build and improve these shelters. At the same time, it can be expected that the construction of other shelters, including heavy bunkers, will be continued for workers and certain vital facilities in essential industrial, transport, and communications activities and for Party and government personnel.